REMARKS/ARGUMENTS

Claims 1, 3-6, 8-10, 20, 22-25, 27-29, and 39-42 are pending in the present application, of which claims 1, 6, 20, 25, 39, 40, 41, and 42 are the independent claims. Applicants believe that the present application is in condition for allowance, for which prompt and favorable action is respectfully requested.

Applicants appreciate the indication in the Advisory Action that the § 101 rejection of claims 1, 3-5, 6 and 8-10 are withdrawn.

Claim Rejections – 35 USC § 101

Claims 20, 22-24, 25, 27-29, and 39-40 are rejected under 35 U.S.C. § 101 for being directed to non-statutory subject matter.

The Office Action rejected claims 20, 22-24, 25, 27-29 and 39-40 by stating "the claimed apparatus directs to logic or module or algorithm and in accordance with the applicant's specification, logic or modules or algorithm is computer software **[Specification, page 15, paragraph 1055]**. As such, the claimed apparatus must include hardware or physical transformation necessary to realize any of the functionality of the claimed modules and produce a useful, concrete and tangible result. Absent recitation of such hardware or physical transformation as part of the claimed apparatus, it is considered non-statutory." Applicants respectfully disagree.

To begin with, each of claims 20, 22-24, 25, 27-29 and 39-40 are explicitly directed to an "apparatus," which constitutes patentable subject matter under 35 U.S.C. § 101. Therefore, Applicants submit that each of claims 20, 22-24, 25, 27-29 and 39-40 are directed to patentable subject matter for at least this reason.

Second, claims may cover both hardware and software embodiments. For instance, in *Overhead Door Corp. v. Chamberlain Group, Inc.*, 194 F.3d 1261, 1271-73 (Fed. Cir. 1999), the court held that one skilled in the art would have understood that a patent's disclosure of a flow diagram represented disclosure of an alternative software embodiment of a switch. The court concluded that the district court should have included software as corresponding structure to the switch means limitation in the patent. *See Id.* at 1273, "The differences in claim language, bolstered by the patentees' statements during reissue proceedings, cause this court to reach a broader construction for claim 5 than for claim 1.... The district court erred in ruling that only

the mechanical switch in Figure 2 is 'corresponding structure' for the claimed 'switch means.' 'Switch means,' when properly construed, also covers the software-based embodiment described in Figure 3." Since claims 20, 22-24, 25, 27-29 and 39-40 may cover both hardware and software embodiments, these claims are drawn to patent eligible subject matter under 35 U.S.C. § 101 and are valid.

Applicants made similar arguments in the previous response to the Office Action. In its response to Applicants' previous response, the Advisory Action states "Examiner disagrees with the applicant's remark that software embodiment of the above claims are tied to the "apparatus" of these claims, since the apparatus claim does not explicitly include a hardware component/element. As per the specification [page 15, paragraph 1055] of the present application, the various logical blocks, modules, circuits and algorithms steps described in the present application may be implemented as electronic hardware, computer software or a combination of both. Therefore, the claimed apparatus is not limited to hardware only or a combination of hardware and software only, instead being sufficiently broad so as to encompass software alone. As such, the claimed apparatus must include the hardware necessary to realize any of the functionality of the claimed modules and produce a useful, concrete and tangible result. Absent recitation of such hardware as part of the claimed system, it is considered non-statutory." Applicants respectfully disagree.

As discussed above with reference to the decision in *Overhead Door Corp. v. Chamberlain Group, Inc.*, claims are not limited to hardware embodiments, and may cover both hardware and software embodiments. Because claims may cover both hardware and software embodiments, the claims are not required to explicitly recite hardware to constitute statutory subject matter.

Further, Applicants submit that the apparatus claims 20, 22-24, 25, 27-29 and 39-40 also satisfy the transformation prong of *In re Biliski*, and are therefore also directed to patentable subject matter for this reason. The court in *In re Biliski* specifically noted that "the main aspect of the transformation test that requires clarification here is what sorts of things constitute 'articles' such that their transformation is sufficient to impart patent-eligibility under § 101." *See, In re Biliski*, 545 F.3d 943,962 (Fed. Cir. 2008). The court reasoned that the raw materials of many information-age processes, however, are electronic signals and electrically-manipulated data. *Id.*

Here, the article being transformed is the "information bits of the control message" recited in the claims. Claims directed to processing of electronic communications, such as signals for transmission, have been recognized as types of claims that are eligible for patent protection. (Here, the control message is a signal for transmission. See paragraph [1010] of the specification, "the base station also transmits control messages on a Forward Packet Data Control Channel (F-PDCCH)." Transforming the "signal" is sufficient to satisfy the transformation prong of the test in *In re Bilski*, and no physical steps or acts are further required. *In re Bilski* provided a spectrum of examples that illustrate the types of transformations that are eligible for patent protection. As noted above, the court found that "the electronic transformation of the data itself into a visual depecition" was a sufficient example which satisfied the transformation prong. *Id.* at 963. This is how the *Abele* court distinguished an upatentable broad independent claims reciting a process of graphically displaying variance of data from average values from a patentable dependent claims. *In re Abele*, 684 F.2d 902, 908-09 (CCPA 1982). However, the transformation of "the data itself into a visual depiction … that represents specific physical objects or substances . . ." is not a requirement of the transformation prong, just one example which satisfied the transformation prong. *In re Bilski* at 963.

In the present patent application, the apparatus claims 20, 22-24, 25, 27-29 and 39-40 "scramble[e] the information bits of the control message with the determined scrambling sequence in accordance with the metric." Thus, the information bits of the control message are identified as the subject matter being transformed to scrambled information bits. Because the "signal" for transmission, a patent-eligible article, is transformed to scrambled information bits, i.e., transformed to a different state or thing, apparatus claims 20, 22-24, 25, 27-29 and 39-40 do transform the underlying subject matter as required by the transformation prong of the test. *See In re Bilski*, 545 F.3d at 951, n.2 (The Federal Circuit "note[s] that the PTO did not dispute that the process claims in Nuijten were drawn to patent-eligible subject matter under § 101 and allowed those claims.") Thus, apparatus claims 20, 22-24, 25, 27-29 and 39-40 satisfy the transformation prong of *In re Bilski*, and are therefore also directed to statutory subject for this reason.

Applicants also submit that the scrambling of the information bits of the control message results in the "signal" having a different function or use than the "signal" before scrambling, providing further evidence that apparatus claims transform the "signal." As explained in the

present application, the scrambling of the information bits of the control message prevents repetitive false alarm events due to repetitive control message contents transmitted on a control channel (e.g., F-PDCCH). See, e.g., paragraphs [1016] and [1042] of the prevent application. Thus, the prevention of repetitive false alarm events due to repetitive control message contents is an example of a different function or use of the "signal" resulting from the scrambling of the information bits of the control message with the determined scrambling sequence in accordance with the metric.

Therefore, Applicants respectfully submit that the apparatus claims 20, 22-24, 25, 27-29 and 39-40 constitute patentable subject matter, and respectfully request that the § 101 rejection of these claims be withdrawn.

Claim Rejections – 35 USC § 103

Claims 1, 3, 4, 6, 8, 9, 10, 22, 23, 25, 27, 28, and 39-42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent (U.S. 5,060,266) (hereinafter "Dent") in view of Juha Heikkila et al. (GB 2294853) (herein after "Heikkila"). Claims 5 and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent in view of Heikkila and in further view of Bodin (U.S. 6,973,189) (hereinafter "Bodin"). Claims 10 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Dent in view of Heikkila and in further view of Fisher (U.S. 5,321,754) (hereinafter "Fisher"). Reconsideration and withdrawal of these rejections are respectfully requested.

Claim 1 is directed to a method for scrambling information bits in a communications system. The method includes determining a scrambling sequence based on a metric of system time, wherein the determining the scrambling sequence includes determining the metric based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted, and scrambling the information bits of the control message with the determined scrambling sequence in accordance with the metric. Applicants submit that none of the applied references, taken individually or in combination, teaches or suggests the method of claim 1.

The method of claim 1 prevents repetitive false alarm events due to repetitive control message contents transmitted on a control channel (e.g., F-PDCCH). As discussed in the present application, the same control message may be transmitted on the control channel from time to

time. See, e.g., paragraph [1016] of the present application. When the contents of a control message result in a false alarm event, the false alarm event may be repeated when the same control message contents are retransmitted on the control channel, leading to repetitive false alarm events. See, e.g., paragraph [1042] of the present application. The method of claim 1 prevents repetitive false alarm events by scrambling the information bits of a control message with a scrambling sequence based on a metric of system time, in which the metric is determined based on a subinterval of a system time interval of the control channel. As a result, the scrambling sequence changes for different subintervals of the control channel. Thus, when the same control message contents are repeated at different subintervals of the control channel, each repetition of the control message contents are scrambled with a different scrambling sequence. As a result of the scrambling, the control message contents differ for each repetition, preventing repetitive false alarm events. This is neither taught nor suggested by any of the applied references.

Dent discloses a system for synchronizing encryption devices in a digital cellular communications system. See Abstract of Dent. Dent discloses that, in a cellular system, an RF channel is divided into a series of "time slots" containing bursts of information. See col. 6, lines 63-65. Dent also discloses a fast associated control channel (FACCH) for sending control or supervisory messages to a base station. See col. 7, lines 24-31. Dent further discloses a ciphering unit 220 that converts a stream of message bits into a stream of enchipered bits for transmission and outputs a time-of-day or block count to a low rate channel encoder 211. See col. 12, line 55 65. The time-of-day or block count is transmitted to the base station, which uses the received time-of-day or block count to synchronize the deciphering unit of the base station with the ciphering unit 220. See col. 13, lines 35-40. Dent also discloses an encryption system comprising a time clock or block counter 201 that generates a count 213 in response to an increment 215 applied to the input of the time clock or block counter 201. See col. 11, lines 5-13 and Figure 4. The encryption system also comprises a combinatorial logic or mixing process 202 that mixes the count 213 with a secret key 211 to produce a keystream output 209. See col. 11, lines 13-22. The encryption system further comprises a modulo-2 adder 203 that adds each keystream bit with a particular data bit to produce encrypted data. See col. 11, lines 22-28.

However, Dent does not disclose or suggest determining a scrambling sequence based on a metric of system time, wherein the determining a scrambling sequence includes determining the

metric based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted.

Contrary to the Office Action, Dent does not teach or suggest determining a scrambling sequence in accordance with time, wherein determining the scrambling sequence includes determining the time based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted. In its contention that Dent discloses the above features, the Office Action appeared to equate the "time slot" of Dent with a subinterval of a system time interval and equate the FACCH of Dent with a control channel. See page 4 of the Office Action dated November 25, 2009. However, evening assuming, arguendo, that the "time slot" of Dent is a subinterval of a system time interval and the FACCH of Dent is a control channel, Dent would still not disclose determining a scrambling sequence in accordance with time, wherein determining the scrambling sequence includes determining the time based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted. This is because Dent does not disclose either the encryption system in Figure 4 of Dent or the ciphering unit 220 in Figure 6 of Dent determining a scrambling sequence based on "time slots" of the FACCH of Dent. As discussed above, in the encryption system of Dent, the time clock or block counter 201 generates a count 213 in response to an increment 215 applied to the input of the time clock or block counter 201, and the combinatorial logic or mixing process 202 mixes the count 213 with a secret key 211 to produce a keystream output 209. Nowhere does Dent disclose any one of the increment 215 applied to the input of the time clock or block counter 201, the count 213 and the secret key 211 being based on "time slots" of the FACCH of Dent. Further, nowhere does Dent disclose the time-of-day or block count of the ciphering unit 202 being based on "time slots" of the FACCH.

For at least the above reasons, Applicants submit that Dent does not teach or suggest determining a scrambling sequence based on a metric of system time, wherein the determining a scrambling sequence includes determining the metric based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted. Heikkila does not overcome the above deficiencies of Dent for at least the reasons set forth below.

Heikkila discloses a method for implementing subscriber-specific scrambling in a point-to-multipoint system based on time division data transmission, in which data for different

subscribers are transmitted in different time slots. See page 1, lines 5-8 of Heikkila. Heikkila also discloses storing, in a memory, a subscriber-specific scrambling sequence for each subscriber. See page 3, lines 15-25. In each time slot, the scrambling sequence for the corresponding subscriber is read from memory and used to scramble the data for the subscriber. Thus, the time slots of Heikkila are time slots used in time division data transmission among different subscribers, in which each time slot corresponds to a specific subscriber. The time slots of Heikkila have nothing to do with time slots of a control channel. Consequentially, Heikkila does not disclose or suggest determining a scrambling sequence based on a metric of system time, wherein the determining a scrambling sequence includes determining the metric based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted, and therefore fails to overcome the same deficiencies in Dent.

The other applied references Bodin and Fisher, taken alone or in combination, also fail to disclose determining a scrambling sequence based on a metric of system time, wherein the determining a scrambling sequence includes determining the metric based on a subinterval of a system time interval of a control channel in which the information bits of a control message are to be transmitted, and therefore fail to overcome the same deficiencies in Dent and Heikkila.

For at least the reasons given above, Applicants submit that claim 1 is patentable over the applied references, and respectfully request that the rejection of claim 1 be withdrawn.

Independent claims 6, 20, 25, 39, 40, 41 and 42 recite features similar to those in claim 1, and are therefore also patentable for at least the same reasons given above for claim 1.

Claims 3-5, 8-10, 22-24, and 27-29 depend from claims 1, 6, 20 and 25, respectively, and are therefore also patentable for at least the same reasons given above for claims 1, 6, 20 and 25. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

CONCLUSION

In light of the amendments contained herein, Applicants submit that the application is in condition for allowance, for which early action is requested.

Please charge any fees or overpayments that may be due with this response to Deposit Account No. 17-0026.

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